

REMARKS

This is in response to the Office Action mailed August 5, 2003. All of the amendments to existing claims were voluntarily made to clarify terminology. Some claims were cancelled and some new claims were added to enhance the correlation between chains of dependence. No amendments are being made in response to rejections.

Section 103 Rejections

All of the claims stand rejected under 35 USC §103.

Claims 69 - 70, 76, 102 - 104, 110, and 115 stand rejected as being unpatentable over Kuzma et al., U.S. Patent No. 5,295,071 ("Kuzma"). Apparatus claims 69 - 70, and 76 require a digital processor for "continually processing [a] digital detection signal so as to eliminate dead time between lightning events." Similarly, method claims 102 - 104, and 110 require a step of "continually processing [a] digital detection signal so as to eliminate dead time between lightning events." The Office Action alleges that it would have been obvious to modify Kuzma to add these features "for near real time observation of lightning phenomena on a computer display." Applicant respectfully traverses the rejections.

Kuzma does not eliminate dead time, because it is not continually monitoring the incoming signal once a detection threshold is crossed (see Col. 3, lines 19-37; see also Col. 24, lines 29 - 41).

Kuzma indicates that the dead time for a particular class of events that are to be rejected (dart leaders) is 15 samples (Col. 37, lines 47 - 54), which equals 15 μ s in the preferred embodiment because of the 1 MHz digitizing rate (Col. 22, lines 55 - 60). Then, if a waveform is not rejected after the initial 15 μ s, it is processed using the algorithm presented in Figure 36 (see Cols. 37 et

seq.). Kuzma provides no mechanism to assure that other data are not lost during the processing time.

While the Office Action makes an assertion that it would have been obvious to continually process the claimed digital detection signal so as to eliminate the dead time in Kuzma, the assertion is contrary to the teachings of Kuzma. Kuzma provides “for near real time observation of lightning phenomena on a computer display” and Kuzma has at least a 15 μ s dead time. Kuzma does not teach or suggest that it is necessary or desirable to have a temporal resolution of the digital detection signal that is any greater than 15 μ s, and there is no previously known reason that a person of ordinary skill in the art would have been motivated to increase the resolution provided in Kuzma.

On the other hand, the present inventors have recognized that any dead time, even as small as 15 μ s, makes correlation ambiguous and therefore does not permit a precise determination of the location of a series of lightning discharges wherein the time between discharges is less than 15 μ s, such as from cloud discharges. This recognition is not found in the prior art.

Since there is no teaching or suggestion in the prior art that eliminating dead time is important to determine the location of lightning phenomena, or for any other reason, it is respectfully submitted that it would not have been obvious at the time the invention was made to modify Kuzma as alleged.

For this reason, it is not believed to be necessary to argue specifically about all of the subject matter of the dependent claims. However, a few selected points are noted below in connection with specific rejections that demonstrate some important misunderstandings.

With respect to the rejection of claim 115, it should be understood that filters generally provide for amplitude reduction, but not necessarily amplitude compression as claimed. With the

wrong kind of filter, large-amplitude and small-amplitude signals can be altered in improper proportion to one another so that either no dynamic range advantage is obtained, or the dynamic range problem is exacerbated. Amplitude compression decreases the relative magnitude of large signals with respect to small signals so that both can be detected within a relatively small dynamic range.

In rejecting claims 76 and 110, the Office Action argues that Kuzma discloses, among other things, a plurality of sources. Actually, claims 76 and 110 do not recite a plurality of sources. Applicant assumes the examiner intended to refer to claim 91, which does recite a plurality of sources, and claim 111, which recites a plurality of electrical detection signals from different locations. It was intended for claim 91 to mirror claim 111 in this regard, so claim 91 has been amended to recite that the plurality of sources are at different locations. The two antennas in Kuzma are not at different locations, and so the problem to which the present invention is directed does not arise in Kuzma.

With regard to the rejection of claims 78 - 80, 87 - 89, and 112 - 114, it should be noted that compression and decimation are qualitatively different functions. Compression does not lose data, whereas decimation discards data. Further, synchronous decimation as recited in claims 80, 89, and 114 decimates in a particular way that requires at least two sources of data at different locations for which decimation can be synchronized. Non-uniform sampling such as allegedly disclosed in Coffey et al., U.S. Patent No. 6,492,929, is neither compression, decimation, nor synchronous decimation.

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For at least the above reasons, it is respectfully submitted that claims 69, 71 - 76, 78 - 89, 93 - 97, 100 - 102, 105 - 110, 112 - 114, 120, 122 - 129, and 132 - 142 remaining in this case are in condition for allowance, and the examiner is therefore respectfully requested to allow these claims and pass this case to issue.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Garth Janke', written in a cursive style.

Garth Janke
Reg. No. 40,662
(503) 228-1841

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